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H. BROOK

CHAIN DRIVE MECHANISM FOR BOBBIN SHAFTS OF ROVING FRAMES

Filed Oct. 29, 1923

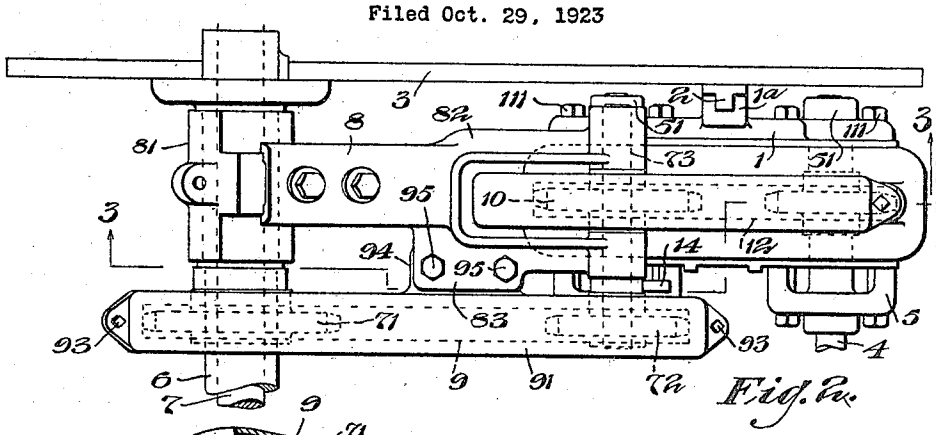

Fig. 2.

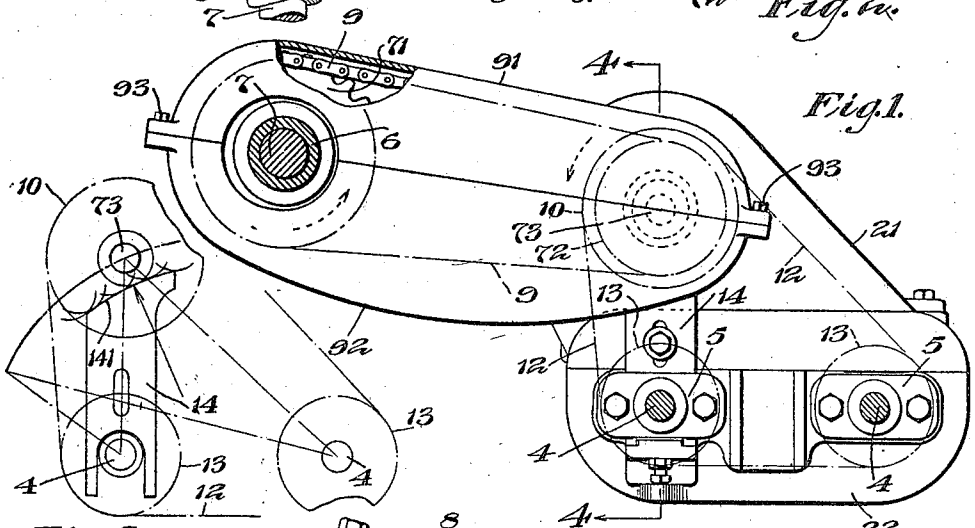

Fig. 1.

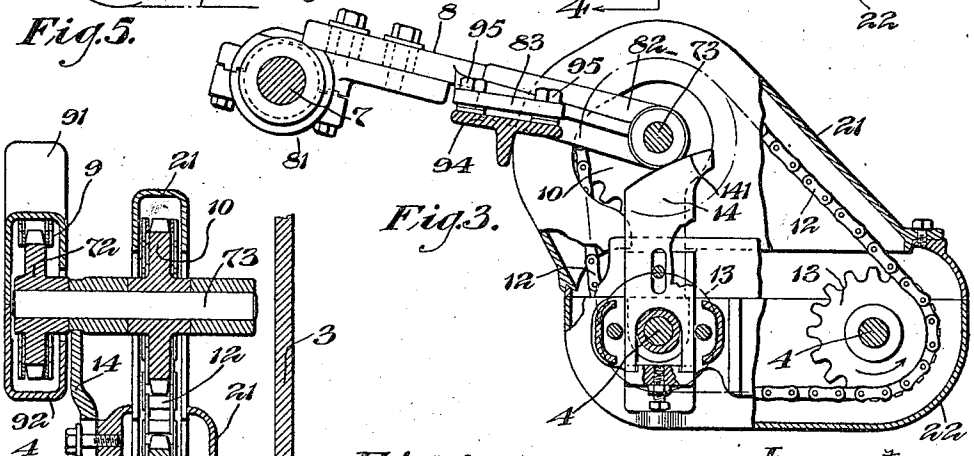

Fig. 3.

Fig. 4.

Fig. 5.

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UNITED STATES PATENT OFFICE.

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CHAIN-DRIVE MECHANISM FOR BOBBIN SHAFTS OF ROVING FRAMES.

Application filed October 29, 1923. Serial No. 671,404.

To all whom it may concern:

Be it known that I, HARRY BROOK, a citizen of the United States, residing at Woonsocket, in the county of Providence, State of Rhode Island, have invented a certain new and useful Improvement in Chain-Drive Mechanism for Bobbin Shafts of Roving Frames, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention provides simplified and improved chain-drive mechanism for transmitting rotary motion from the compound of a roving frame to the bobbin-shafts of the latter.

The invention is an improvement upon the chain-drive mechanism, commonly termed the Daly drive, which is shown, described, and claimed in the U. S. Patent to R. B. Daly, No. 895,541, granted August 11, 1908, for slubber or fly frame. The Daly drive comprises a sprocket-wheel connected with the sleeve of a roving frame compound, a sprocket-chain extending from such sprocket-wheel to one on an intermediately located jackshaft, a second sprocket-chain connecting another sprocket-wheel on the jackshaft with one on one of the bobbin-shafts, spur-gears fixed on the bobbin-shafts and transmitting rotary motion from one to the other thereof, and means including a cam for controlling the position of the jackshaft to maintain the two chains at a uniform tension during the up-and-down traverse movements of the traverse-rail and bobbin-shafts.

My invention dispenses with the spur-gears aforesaid for transmitting rotary motion from one bobbin-shaft to the other, and places the second sprocket-chain in direct driving engagement with a sprocket-wheel upon each of the bobbin-shafts. In this latter respect, the improved drive-chain mechanism is differentiated from the Daly drive as heretofore constituted.

An embodiment of the invention is illustrated in the drawings, in which latter,—

Fig. 1 is a view of that portion of a roving frame containing the said embodiment, in section in a vertical plane extending from front to rear.

Fig. 2 is a plan view, with portions of the covers removed.

Fig. 3 is a view in side elevation partly sectional on a line 3, 3, of Fig. 2.

Fig. 4 is a view in section on line 4, 4, of Fig. 1.

Fig. 5 is a diagram illustrating the layout of the controlling cam-piece to which reference is made hereinafter.

The drawings do not show the usual traverse-rail, but they do show a side 1 (Fig. 1,) such as that which in practice is connected with the head end of the traverse-rail, its outer side having the groove 1^a receiving a vertically extending guide-rib 2 upon the head 3 of the machine-frame, on which guide-rib the slide moves up and down in the vertical traversing movement of the traverse-rail. The covers 21, 22, hereinafter described, constituting the bobbin-shaft gear-box, are attached to the said slide by means of suitable bolts 111, 111. The drawings show the end portions of bobbin-shafts 4, 4, as mounted in bearings 5, 5, and 51, 51, in connection with the bottom cover-section 22 of the said gear-box and with the said slide respectively. There are two bobbin-shafts as required for the driving of the two longitudinal lines of bobbins employed in connection with the two lines of flier-spindles in a roving frame, the said bobbin-shafts being driven through connections with the sleeve 6 surrounding the main or first motion shaft 7, the said sleeve being an element of the compound and being driven in well-known manner at progressively varying speed in the operation of the machine. The chain-drive mechanism constitutes in the case of the Daly drive and the present invention, the bobbin-shaft driving connections.

Referring now to the chain-drive mechanism:—

A driving sprocket-wheel 71 is fixedly connected with the compound driving sleeve 6. A sprocket-chain 9 extends partway around the driving sprocket-wheel 71, and partway around a sprocket-wheel 72 on a jackshaft 73 that is located adjacent and above the rear bobbin-shaft 4. The jackshaft 73 corresponds with the jackshaft of the usual Daly drive, and like the latter it is held at the proper distance from the main shaft 7, by means of a radius arm 8 having a hub or bearing 81 which surrounds the shaft 7 concentrically. The said radius arm 8 is in this instance of forked yoke-shape, its branches 82, 83, being provided with

bearings in which the jackshaft 73 is mounted with one end projecting laterally and having the driven sprocket-wheel 72 mounted thereon. Between the two bearings of the radius arm the jackshaft has fixed thereon a sprocket-wheel 10 which is in driving connection with the two bobbin-shafts 4, 4, by means of a sprocket-chain 12 which partially encircles and engages the said sprocket-wheel 10 of the jackshaft, and sprocket wheels 13, 13, which are fixed on the said bobbin-shafts. Thus in this construction the second sprocket-chain, engaged and actuated as explained by the sprocket-wheel 10 of the jackshaft, directly engages each of the respective sprocket-wheels 13, 13, of the two bobbin-shafts.

At 14 is a cam piece attached to the inner side of the cover 21 of the gear-box, and having its upper end of proper cam shape to serve by its engagement with a hub projecting from one branch, 83, of the radius arm 8, to support the jackshaft at the proper height above the rear bobbin-shaft, and vary said height so as to keep the sprocket-chain 12 in a uniform state of tension during all the shifts of the jackshaft forward and rearward that are incident to the control of the jackshaft by the radius arm as the traverse-rail, bobbin-shafts, etc., traverse up and down relative to the motion of the main shaft. The said cam piece 14 corresponds in function with the cam piece (14, 17) of Daly Patent No. 895,541, aforesaid.

As will be apparent from the foregoing description, and the accompanying drawings, a chain-drive mechanism according to the present invention comprises fewer parts than the Daly drive by reason of the bobbin-shafts being driven from the jackshaft by means of a sprocket-chain and three sprocket-wheels, as compared with a sprocket-chain, two sprocket-wheels, and two spur-gears, as in the case of the Daly drive. The construction is less expensive, inasmuch as the sprocket-wheels which according to the present invention are mounted upon the bobbin-shafts are smaller than the spur-gears of the Daly drive, contain less weight of material, require less time for cutting them, and in general are more economical.

The cam-piece 14 has the upper end 141 thereof, upon which the hub aforesaid of yoke-arm 82 rests, in order to provide for the support of the forward portion of the radius arm 8, (see Fig. 3), specially shaped for the purpose of maintaining the chain 12 at a uniform tension throughout the traversing movements of the traverse-rail up and down. To this end, as illustrated more particularly in Fig. 5, the top face of the said end is formed and arranged so that it corresponds with a section of an elliptical curve, the foci of the ellipse being at the centers of the bobbin-shafts 4, 4. In the up and down traversing movements of the traverse-rail the hub aforesaid of yoke-arm 82 slides back and forth upon the said acting face at the upper end of the cam-piece, but in virtue of having the said acting face shaped and arranged to correspond with the section of an elliptical curve relating as has been explained with respect to the axes of the two bobbin-shafts, it follows that in all positions of the traverse-rail in its movements up and down the chain 12 passing around the sprocket-wheel 10 on the jackshaft and the two sprocket-wheels 13, 13, of the bobbin-shafts remains at uniform tension.

The chain 9 and sprocket-wheels 71, 72, are enclosed by a cover comprising upper and lower sections 91, 92, which are fastened together by bolts 93, 93, one of such sections having a lateral flange 94 which is engaged by bolts 95, 95, whereby such cover is made fast to branch 83 of radius arm 8.

What is claimed as the invention is:—

1. Bobbin-shaft chain-drive mechanism for roving frames comprising in combination with the two bobbin-shafts of a roving frame, sprocket-wheels respectively fixed on the respective bobbin-shafts, a sprocket-wheel connected with the sleeve of a roving frame compound, an intermediately located jackshaft, sprocket-wheels on said jackshaft, a sprocket-chain extending from the sprocket-wheel of the compound to one of those on the jackshaft, and a second sprocket-chain connecting another sprocket-wheel on the jackshaft directly with each of the sprocket-wheels upon the respective bobbin-shafts.

2. Bobbin-shaft chain-drive mechanism for roving frames having combined with the two bobbin-shafts of a roving frame, a jackshaft, sprocket-wheels respectively fixed on the respective bobbin-shafts, and on the jackshaft, a sprocket-chain engaging the three sprocket-wheels just mentioned, a driving wheel actuated through the compound of the roving frame, driving connections intermediate said driving wheel and the jackshaft, a radius arm swinging concentrically with the said driving wheel and engaging with the said jackshaft, and a cam-piece moving vertically in unison with the bobbin-shaft and having a cam face controlling the said radius arm and jackshaft vertically, with said cam face formed on an elliptical curve, the foci of which are the axes of the two bobbin-shafts.

HARRY BROOK.